

Gottfried W. Ehrenstein

Polymeric Materials

Structure – Properties – Applications

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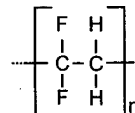
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PVDF - Polyvinylidene Fluoride**Type:** amorphous, semi-crystalline**Characteristics:** good strength, high chemical and radiation stability, high susceptibility to residual stress**Identified by:** pungent smell when burned, difficult to ignite**Structure:****Properties*:**

$\rho = 1.76 - 1.78 \text{ g/cm}^3$

$E = 2000 - 2900 \text{ MPa}$

$\sigma_Y = 50 - 60 \text{ MPa}$

$\epsilon_Y = 7 - 10\%$

$\epsilon_F = 20 - > 50\%$

$T_g = 40^\circ\text{C}$

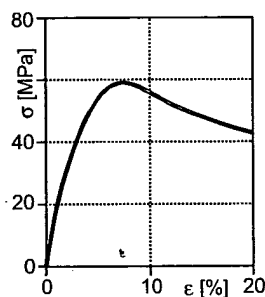
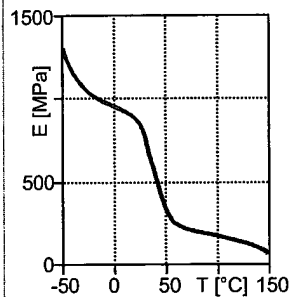
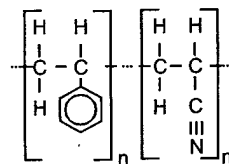
$T_{pm} = 170 - 175^\circ\text{C}$

Thermal Limits:

Short-time -

Long-time $\sim 150^\circ\text{C}$

* Values for homopolymer

Stress-Strain Diagram:**Elastic Modulus f (Temp):****SAN - Styrene-Acrylonitrile Copolymer****Type:** amorphous**Characteristics:** high strength and stiffness, good dimensional stability, good chemical resistance, lower resistance against stress cracking than PS**Identified by:** yellowish, transparency, smell of styrene when burned, bright flame, soot forming**Structure:****Properties:**

$\rho = 1.08 \text{ g/cm}^3$

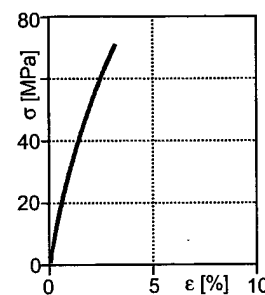
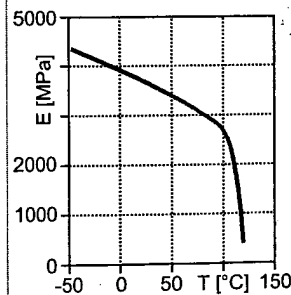
$E = 3500 - 3700 \text{ MPa}$

$\sigma_F = 65 - 85 \text{ MPa}$

$\epsilon_Y = -$

$\epsilon_F = 2.5 - 5\%$

$T_g = 95 - 105^\circ\text{C}$

Thermal Limits:Short-time $\sim 95^\circ\text{C}$ Long-time $\sim 85^\circ\text{C}$ **Stress-Strain Diagram:****Elastic Modulus f (Temp):**

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